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# A Comparative analysis of Scopus and Web of Science (WoS) literature on the Autism Crisis.

## Abstract

Autism is a neurobiological developmental disorder that is detected at around 3 years old. This disorder affects their communication, socialization and behavioral skills. Its ratio is 1 per 150 and the possibility is greater for boys (2 girls for every 6 boys). A bibliometric analysis, comparing documents in the Scopus and Web of Science databases, has been carried out. It includes some new features such as the evaluation of growth, maturity, conceptual and intellectual maps and trends of a scientific community on top of the bibliometrics traditional approach. This study shows that, although the interest in different aspects related to autism is very high (from the year 2000), there is a significant lack on the prevention or prediction crisis topic.

**Keywords:** autism crisis; bibliometric analysis; comparative analysis; Web of Science; Scopus; factorial analysis.

## 1. Introduction

Autism Spectrum Disorder (ASD) is a developmental and neurological disability that begins in childhood and lasts all lifetime. It affects how a person behaves, interacts with others and communicates. People with autism have certain characteristics that are within a wide spectrum of behaviors, characteristics or abilities such as, for example, difficulty or absence of verbal communication, learning difficulties, intellectual disabilities and more (Prelock and Wolf, 2012). Depending on the degree to which a person has several of these items within the autistic spectrum, the person is classified with a level of autism that ranges from mild (where the person can even lead a normal life) to severe or profound (where the person has full dependence on his/her caregiver). These people can frequently present comorbid conditions such as epilepsy, attention deficit disorder, hyperactivity, anxiety or depression (Simonoff et al., 2008).

People with autism can experience behavioral crises in which they try to injure themselves and/or injure those who are with them at the time of the crisis. The reasons why these crises occur can be very varied (no tolerance for loud noises, being touched, frustration, etc.) (Guinchata et al., 2015). On many occasions, there are a number of circumstances that cause a crisis. These crises have a very negative effect both on the person with autism and on their family environment.

In addition to conducting a comparative analysis on the research on behavioral crises in people with autism, it is also intended to validate a set of three hypotheses. The first hypothesis of our group is that there was an increase in interest in autism. Our group wants to confirm this statement with data and try to find a reasoning and timing for that statement. The second hypothesis of the study is that there is less research on behavioral crisis in people with autism than on other types of crisis with a similar prevalence rate, such as crisis in people with epilepsy. The third hypothesis of the group is that there is no study that focuses on the prediction of behavioral crisis in people with autism.

To confirm or discard these hypotheses, several analyzes were performed, including a bibliometric analysis by searching the keywords "autism" and "crisis" in the Scopus and WoS databases. We have analyzed several items as: the distribution by countries, the evolution of the publications in the different sources, the authors and the conceptual, intellectual and social structure. Subsequently, an analysis of the results has been carried out to respond to the hypotheses raised. Finally, the conclusions reached and the proposal for future work are presented.

## 2. Material and methods

In this section, we will explain the several stages in the development of the bibliometric analysis. A bibliometric analysis is a method to analyze the size, growth and distribution of scientific publications. In addition, it also explores dynamics from research development groups, collaboration networks on the topic and citations (López et al., 1992; Terrada and Peris, 1982).

Our first approach was to choose the quality dimensions. The most used quality dimensions relevant for assessing a researcher are productivity and impact; there are other metrics as an independence indicator (Van den Besselaar and Sandström, 2018) too. There are some reviews, even from the tools themselves (Moral et al., 2020), where *Bibliometrix* seems an optimal tool for our analysis because it is an open source R package for performing comprehensive SMA (Science Map Analysis) (Aria and Cuccurullo, 2017) and openness was our first step. The stages to perform the analysis are based on a SMA workflow. Moreover, it empowers the efficient Biblioshiny web tool. It mainly works with WoS (Web of Science DDBB), Scopus and Dimensions data, thus, this was the second requirement, to work with WoS and Scopus. Finally, it incorporates several analysis options and they are subdivided in 7 categories: 1) Overview, 2) Sources, 3) Authors, 4) Documents, 5) Conceptual structure, 6) Intellectual structure, and 7) Social structure. It is a powerful library that can perform complete bibliometric and scientometric analysis. In recent years, many authors have published database comparisons on different topics to compare the results obtained (Harzing and Alakangas, 2016; Chadegani et al., 2013; Falagas et al., 2008; Archambault et al., 2009; Mongeon and Paul-Hus, 2016). Furthermore, it allows to obtain multiple types of graphs; features not common in other libraries. We also choose VOSviewer (Van Eck and Waltman, 1997) to obtain more detailed graphics to exemplify some features.

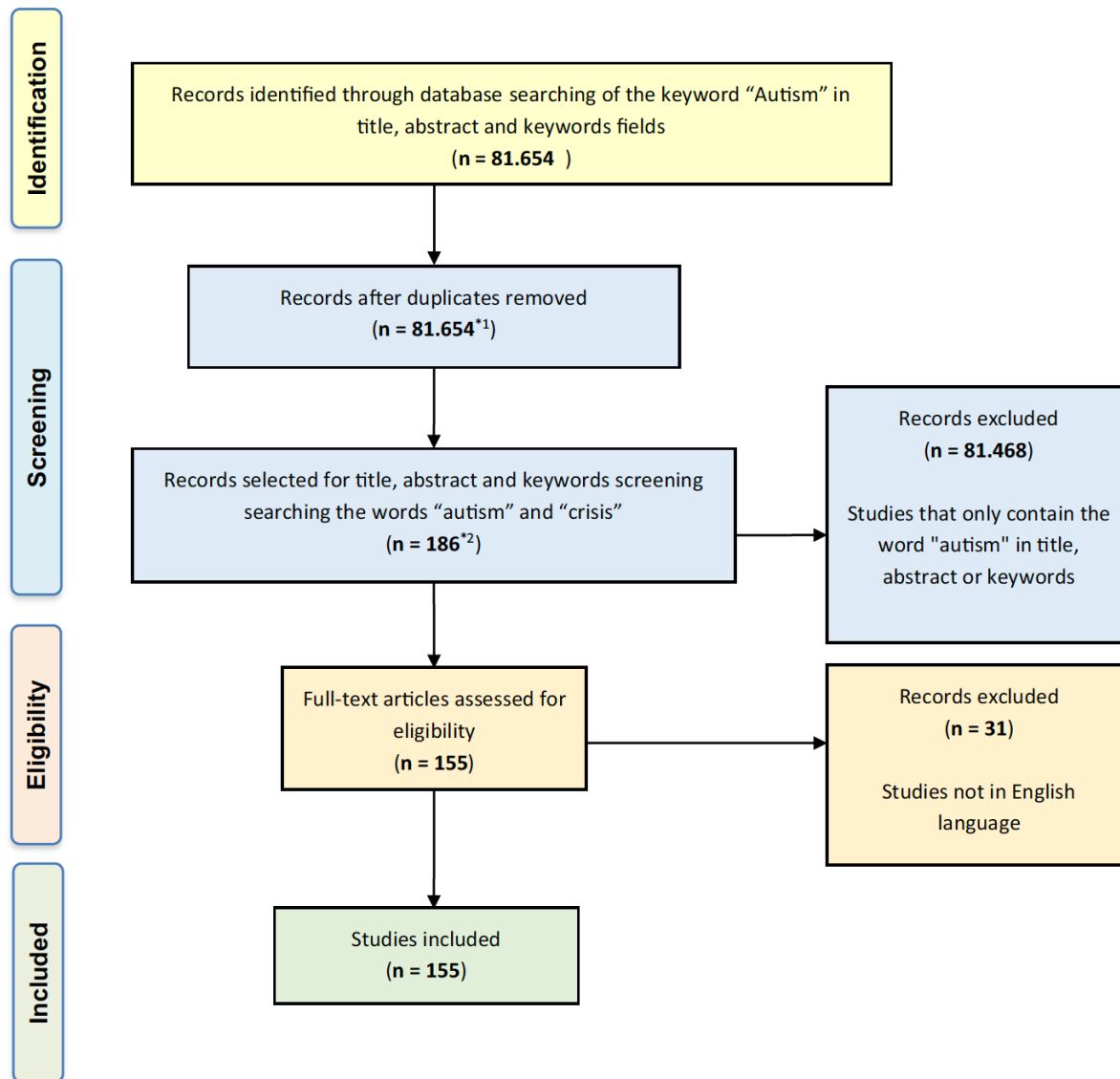
Other scientific bibliometric reviews related to autism spectrum disorder have been published recently, such as (Sweileh et al., 2016) or (Whyatt and Torres, 2018). Both publications are based on searches on one of the two databases (WoS or Scopus). In (Sweileh et al., 2016), the search is only done taking into account the field "Article Title" in the Scopus database. In (Whyatt and Torres, 2018), the search is done analyzing the following fields: "Title", "Abstract" and "Keywords" but only in WoS database. Our research has been carried out on the two databases (Scopus and WoS), taking into account the topic fields as: "Title", "Abstract" and "Keywords" allowing a more extensive systematic review of the research topic and a comparative analysis with both databases. Furthermore, it should be highlighted that in both cases, the period analyzed in both publications is lower (2005-2014 and 1994-2015 respectively). In our approach, the period analyzed is longer (1961-2019) and most updated, which allows us to visualize more clearly the evolution of research from the beginning to the present.

### 2.1. DDBB Searching

Two different searches to determine the number of publications in Scopus and WoS databases were done. The first search uses the keywords "autism and crisis" and the second one uses the keywords "epilepsy and crisis". 186 and 2749 publications were found respectively in Scopus and 157 and 1954 in WoS database. The prevalence data are also remarkable. The prevalence of epilepsy is 6.38 per 1,000 individuals (0.638%) (Fiest et al., 2017). ASD has a very similar prevalence value: 1 for every 150 individuals (0.667%) (Fombonne, 2009).

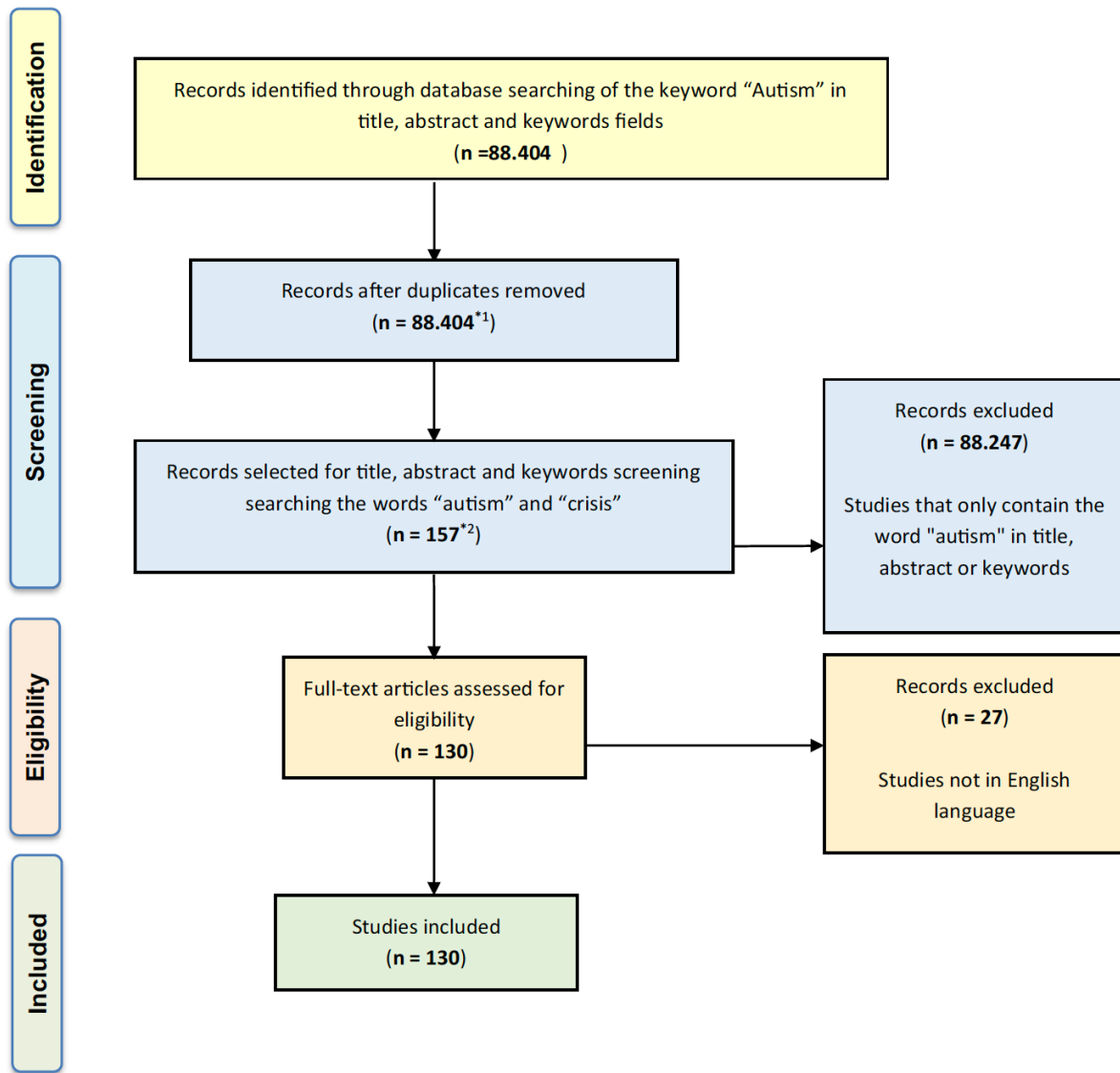
The study continued with the intention of knowing the amount of research carried out so far in the field of autism, in relation to the research carried out in that same field where the main reason for the research is behavioral crises in people with autism. We started by searching the Scopus and WoS databases for the word "autism" in the "title", "abstract" and "keywords" fields (figure 1 and 2). Afterwards, a search query, with the union of the keywords "autism AND crisis", was defined and run in the Scopus and WoS databases. We have carried out searches with words derived

from the keywords of the query, obtaining the same results in number and documents obtained. This is because automatically, both databases already look for the plural and the genitive Saxon of the terms introduced in singular. Thus there is no difference in using the term “crisis“ in the singular form or “crises” in plural (Elsevier 2020). This search found 186 documents in Scopus database between 1974 and 2020, and 157 documents in WoS database between 1961 and 2020. Statistical indicators were extracted from both databases to be compared. In this research, the language queried was English as a requirement.



**Fig. 1** PRISMA Flow diagram for information search in SCOPUS (own elaboration)





**Fig. 2** PRISMA Flow diagram for information search in WoS (own elaboration)

### *Number of publications, distribution for countries*

The publications were analyzed from different points of view, taking into account the type of publication, document's language, number of publications per year, number of publications by country, authors and author relationships, subject area, and keywords used in the documents as: "title", "abstract" or "keyword list".

Afterwards, an analysis with VOSviewer (Van Eck, 2010) is done with both databases to get a comparison of the bibliometric analysis of correlations between keywords and authors. This software shows networks, where the distance of the nodes shows the proximity between them.

VOSViewer was used to map based on bibliographic data to analyze documents from both databases looking for similarities in: co-authorship (authors, organizations and countries); co-occurrence of keywords in the titles, abstracts,

and keywords; and co-citation. All this information is useful to frame what is done in this area, and to identify research trends and gaps of the autism crisis topic, considering the analysis of the documents in the Scopus and Web of Science databases. The fact of carrying out the process through the two databases will allow us to compare the results obtained and discuss the results. The information obtained in this section will be useful to define quantitatively the research done in this topic, confirming or not the previous hypothesis that there is less research than it would correspond to such a prevalent disability.

## **2.2. Source dynamics**

In this section, we are going to focus in the evolution of the different journals, to see the growth along the years to know when exactly begin the interest in our topic and to compare data from the two DDBB: WoS and Scopus.

## **2.3. Authors**

The objective of this section is to detect the top 10 authors with the most publications, analyzing their professional data taking into account: number of publications in the topic during the period analyzed (data available in de WoS database), total number of documents and citations, and the author's h-index (available in Scopus). We would also like to analyze if the 10 authors with the most publications used to work alone, or there is some interaction between them on this topic during the period analyzed.

## **2.4. Conceptual Structure**

### **2.4.1. Co-occurrence Network, Thematic Map and Factorial Analysis**

All these analyses are key in our explanation. The co-occurrence network is a graphic visualization of potential relationships between people, terms or concepts in general. We are interested in a necessary tool to explore relationships among the concepts. The Thematic Map is a graphic visualization, too; that shows how in different periods different themes evolved along time. Factorial Analysis is a way of reducing which are the themes that aggregate all the concepts that arise in the DDBB. It is a powerful technique to see clustering and how the information is grouped.

## **2.5. Intellectual Structure**

In this section we will point out which is relevant academically for researchers.

### **2.5.1. Co-citacion Network and Historiograph**

This graph, the co-citation network, is particularly interesting because it allows us to see the influential papers, which are considered as a reference material, meanwhile the Historiograph shows these relations in a timeline.

## **2.6. Social Structure**

In this section, we are going to show the collaboration network, emphasizing that there are authors who are not as successful, but they make a community, connecting with other authors to collaborate together.

### 2.6.1. Collaboration Network and Collaboration WorldMap

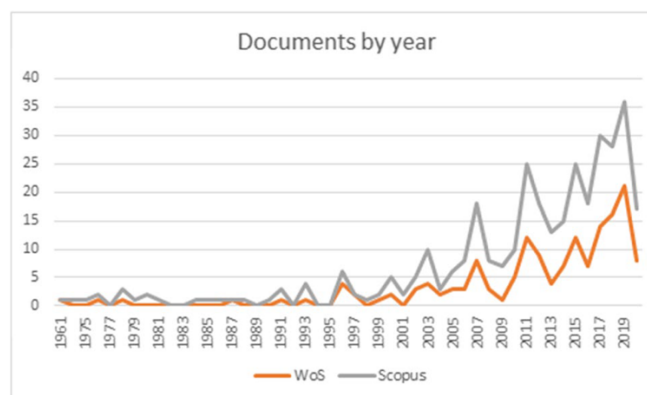
Collaboration Network allows to tune the number of connections among the authors, providing an excellent tool to visualize collaborations and claim attention to authors who care about the academic community and to share knowledge with other researchers. Meanwhile the collaboration WorldMap shows this information geographically.

## 3. Results and discussion

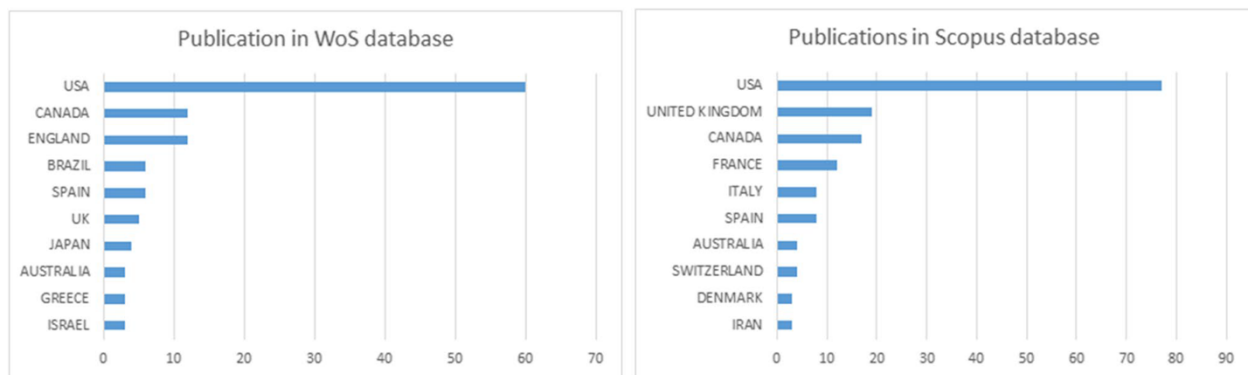
### 3.1. Results from Systematic Literature Search

The trends in the number of publications in the period analyzed for both databases between 1969 and 2020 are shown in Figure 3. In both cases a clear growth trend is observed since the year 2000. Over the past 20 years, the incidence rate of autism spectrum disorders has increased from 4 in 10,000 to approximately 66 in 10,000 (Fombone, 2009). Part of this increase could be due to better diagnoses, the addition of more behaviors added to be considered as autism spectrum disorder, and greater awareness of the disorder (Picardo et al., 2014). This fact reflects the increase in the interest of the scientific community, and consequently the number of publications (Figure 3). Although many of these publications are related to methods or techniques to improve autism detection but is not centered in crisis issue. A study (Tonello et al., 2018) has been carried out that attempts to relate the frequency with which crises occur in people with autism, with the duration and severity of these crises. In this sense, no other studies on the subject have been found.

Figure 4 illustrates the top 10 locations in the ranking of publications in autism crisis research. It is observed that the first source is the USA in both databases. Followed by Canada and UK in the case of WoS database, and the UK and Canada in the Scopus database. Spain is placed in position 5th and 6th respectively.



**Fig. 3** Number of publications by year with autism and crisis as keywords in both databases between 1961 and 2020 (own elaboration)

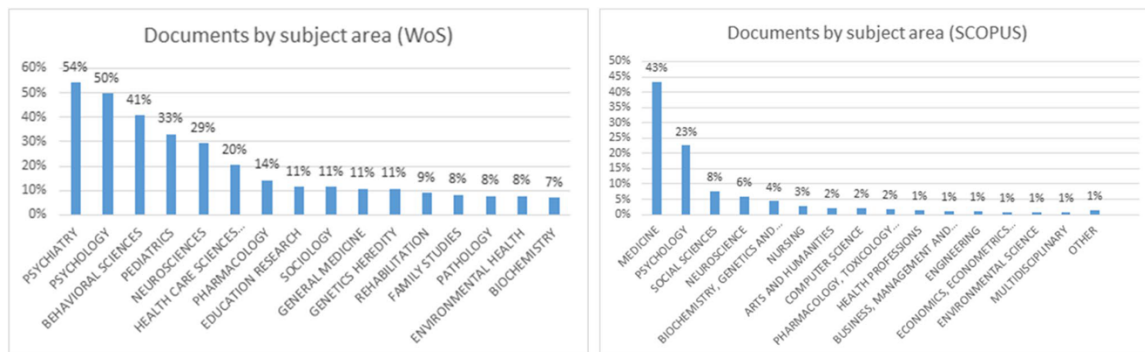


**Fig. 4** Distribution by country during the period 1961-2020: (left) Web of Science; (right) Scopus (own elaboration)

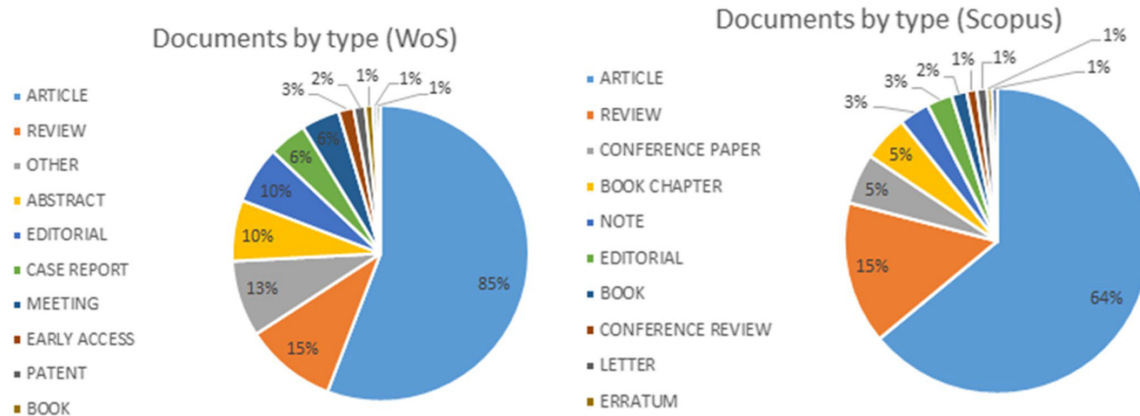
Figure 5 shows the thematic distribution by subject area of the documents in the two databases. It is observed that there are different subject areas in the two databases. The first area in the WoS database is “Psychiatry” and “Medical” in the Scopus one. It should be noted that the second subject area in the two databases is “Psychology”.

Another classification can be made according to the type of document (Figure 6). In both databases, the type of document most published is the scientific article followed by the reviews documents. It seems curious that conference documents are not found in WoS, but in Scopus database is the third document type. Books, in both cases, have little weight compared to the other type of documents.

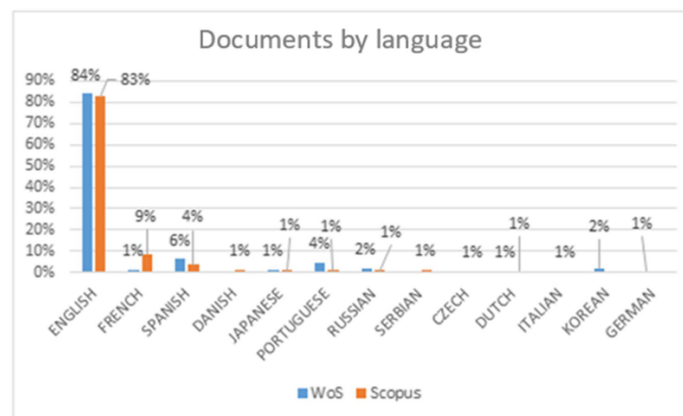
Most of the documents are published in English, 84% in WoS and 83% in Scopus (Figure 7). The following languages in WoS are Spanish, Portuguese, and Korean, meanwhile in Scopus these are French, Spanish and Danish.



**Fig. 5** Documents by subject area with the keywords “autism” and “crisis” during the period 1961-2020: (left) Web of Science; (right) Scopus (own elaboration)



**Fig. 6** Documents by type with the keywords “autism” and “crisis” during the period 1961-2020: (a) Web of Science; (b) Scopus (own elaboration)



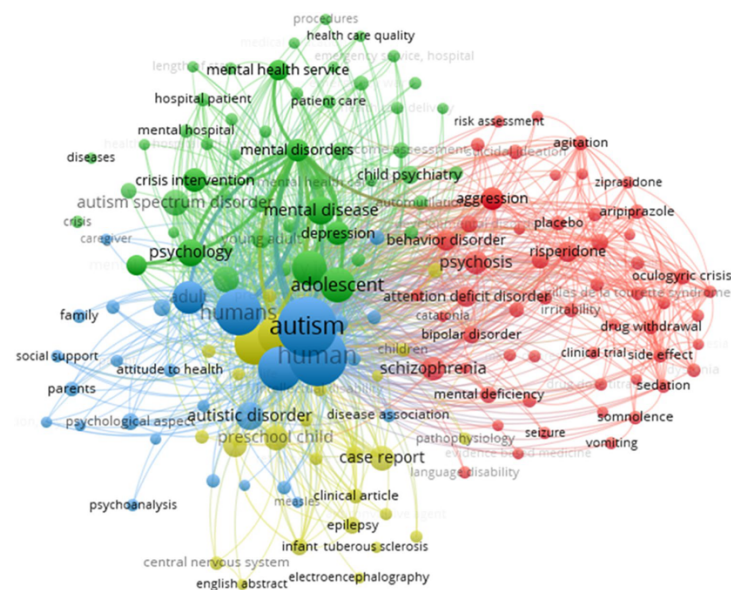
**Fig. 7** Documents by language with the keywords “autism” and “crisis” during the period 1961-2020 in both databases (own elaboration)

Table 1 presents the top ten authors with more publications. The number of publications on the topic during the period analyzed is obtained from the WoS database, Scopus is used to extract the total number of documents from the author, the total number of his/her citations, and the h-index. The author with the most publications is Vasa (h-index=23), from the USA at Kennedy Krieger Institute. Followed by Kalb (h-index=12) and Lunskey (h-index=29) from the USA and Canada respectively. The authors with the most publications are from the USA and Canada. Although in the seventh and ninth positions are Spain and Italy respectively. Bearing in mind the relationship of the authors, there are 4 clusters of working groups with relation between them. The first cluster shows the relation between Vasa, Kalb and Gross from the USA. The second demonstrates that Lunskey and Weiss from Canada publish together. The third one, gives Gabriels and Siegel from the USA and Canada respectively. The last cluster group is formed by Brimes from Spain, Anthony Cerami from the USA and Chiara Cerami from Italy.

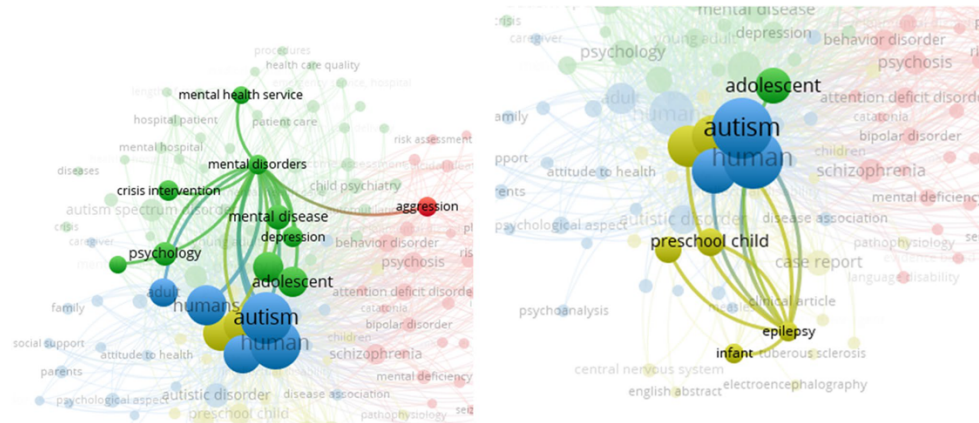
Table 1. Authors with the highest number of publications in the field of study between 1961 to 2020.

Author	Institution	Country	Number of publications on the topic during the period in WoS	Total no. of documents in Scopus	Total number of citations in Scopus	Total h-index in Scopus
VASA ROMA A	Kennedy Krieger Institute	USA	9	53	1533	23
KALB L G	Kennedy Krieger Institute	USA	8	31	653	12
LUNSKY Y	Centre for Addiction & Mental Health—Canada	CANADA	6	188	2625	29
GABRIELS ROBIN L	University of Colorado System	USA	6	35	821	15
SIEGEL MATTHEW	McGill University	CANADA	6	43	1216	15
WEISS Jonathan A	York University	CANADA	5	85	1553	20
BRINES M	UNIVERSITY OF BARCELONA	SPAIN	2	12	245	7
CERAMI ANTHONY	Araim Pharmaceut Inc	USA	2	491	77,872	139
CERAMI CHIARA	Scuola Univ Super IUSS Pavia	ITALY	2	58	1482	22
GROSS ALDEN L	JHSPH Ctr Aging & Hlth Dept Epidemiol	USA	2	131	3042	26

Figure 8 shows details of the co-occurrence map with the documents extracted from the Scopus database. The Scopus map shows 4 clusters: “mental health”, “psychological aspects”, “epilepsy” and “agitation behavior”. Figure 9 shows the details of the co-occurrence keywords in two clusters. This graph demonstrates the initial hypothesis, where we note that there is no research related to the concept of crisis prediction.

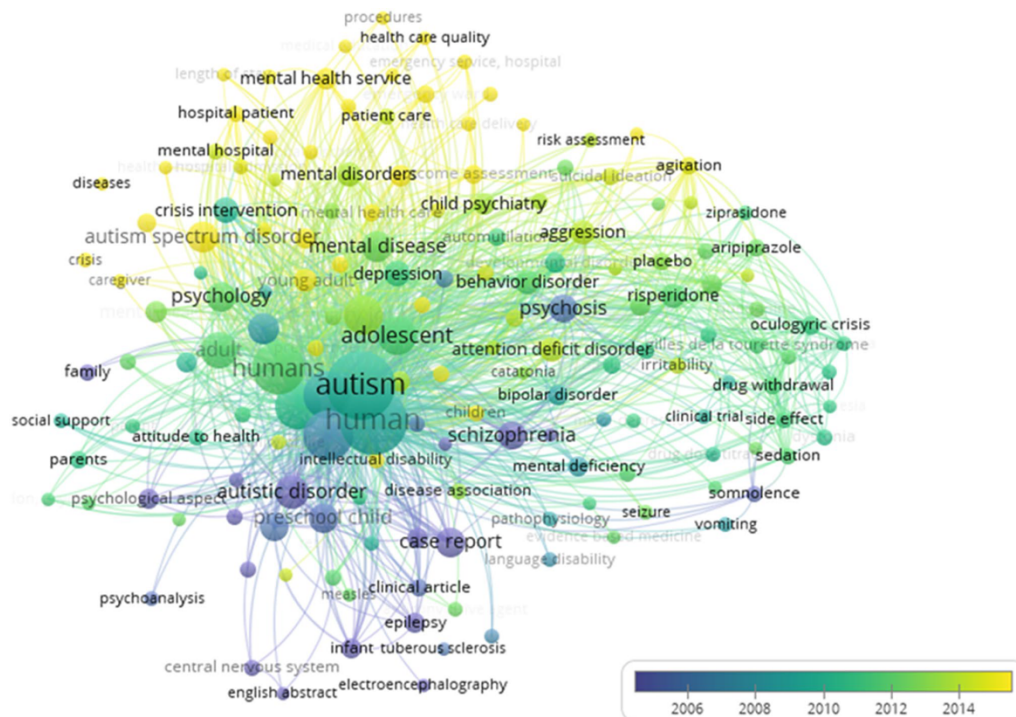


**Fig. 8** Detail of the co-occurrence keywords with the database download with the keywords “autism” and “crisis” during the period 1961–2020 in Scopus database (own elaborations)



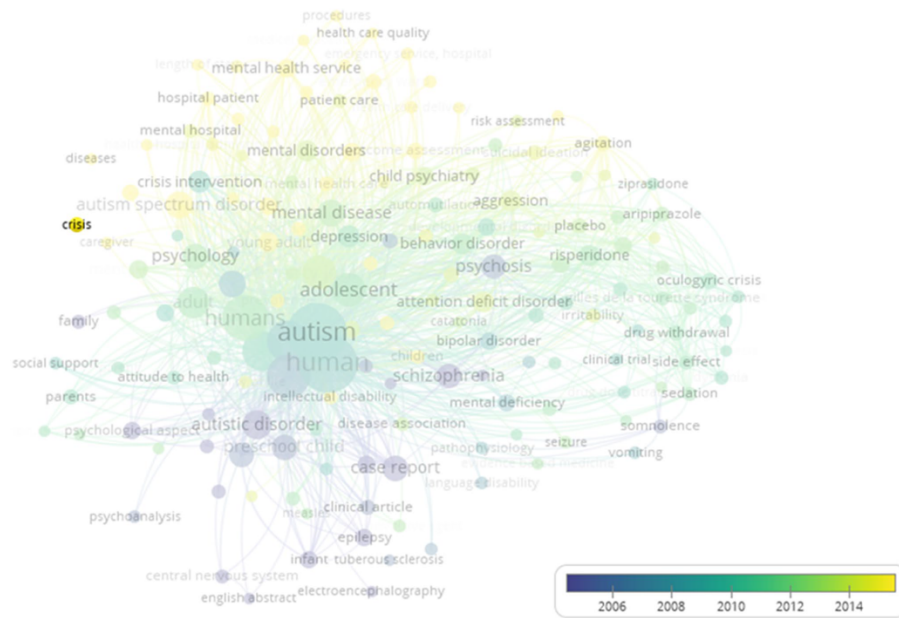
**Fig. 9** Example of detail of the co-occurrence keywords in the green and cluster (own elaboration)

Figures 10 and 11 show the detail of the co-occurrence keywords with the database download with the keywords “autism” and “crisis” during the period 2005-2014 in Scopus database. This graph presents an isolated point with the concept of crisis (yellow), although without any relation to any other keyword. Again, this graph demonstrates the little research related to the autism crisis. Moreover, the yellow color indicates that this topic is between the newest studied by researchers.



**Fig. 10** Detail of the co-occurrence keywords between 2005-2015 (own elaboration)

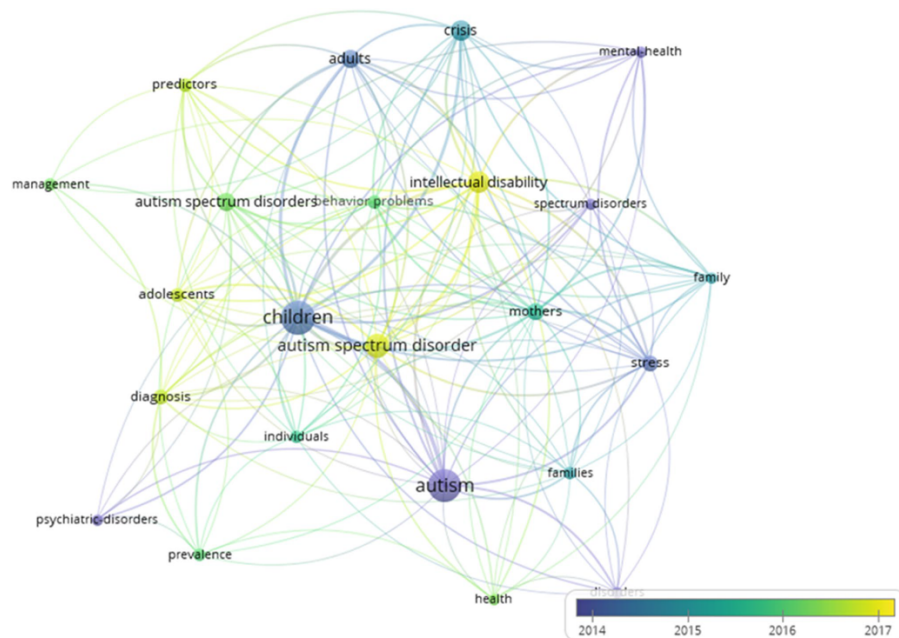




**Fig. 11** Appearance of the keyword crisis in the yellow cluster (own elaboration)

On the contrary, if we analyze the WoS database, quite different information can be found. Figure 12 shows the detail of the co-occurrence keywords with the database download with the keywords “autism” and “crisis” during the period 2005-2014 in WoS database.

In this graph a relation between keywords “crisis” and “predictors” can be found. The keyword “predictors” is in yellow-green color, indicating that this topic was published between 2016 and 2017.



**Fig. 12** Detail of the co-occurrence keywords between 2014-2017 (own elaboration)

Regarding the co-citation network (Figure 13), we observe some authors that reinforce their papers (pink cluster, Weiss, Williams) and authors that come from other areas of expertise such as Baron Cohen as creator of the theory of



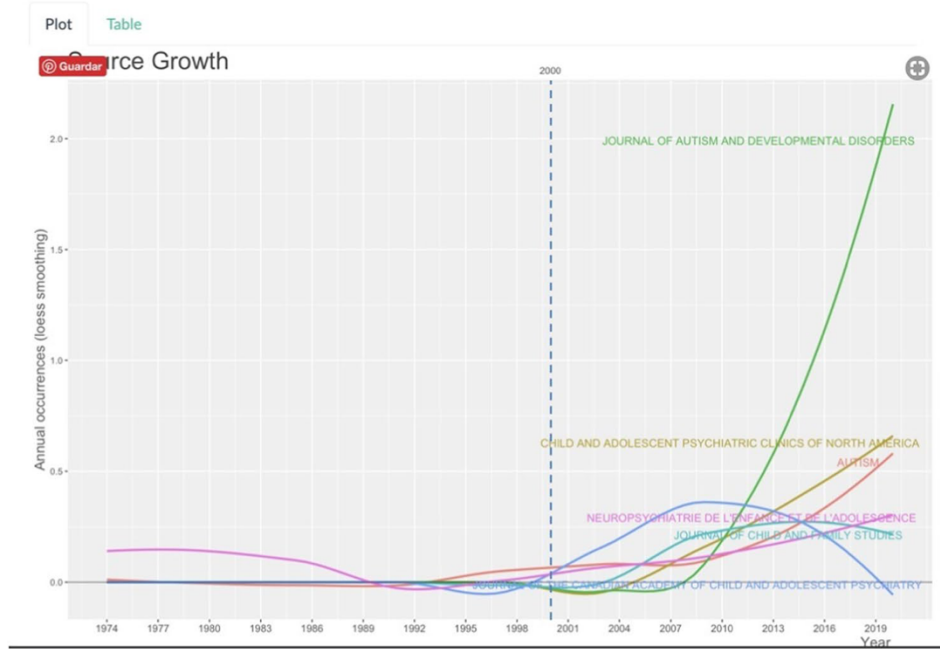
the mind and the relation to the autism area (Baron-Cohen, 2009). This figure has been created using Kamada & Kawai network layout, edge betweenness as clustering algorithm, 50 nodes, removing isolated nodes and with a minimum of 2 edges.

**Fig. 13** Detail of the co-citation network in Scopus database (own elaboration)

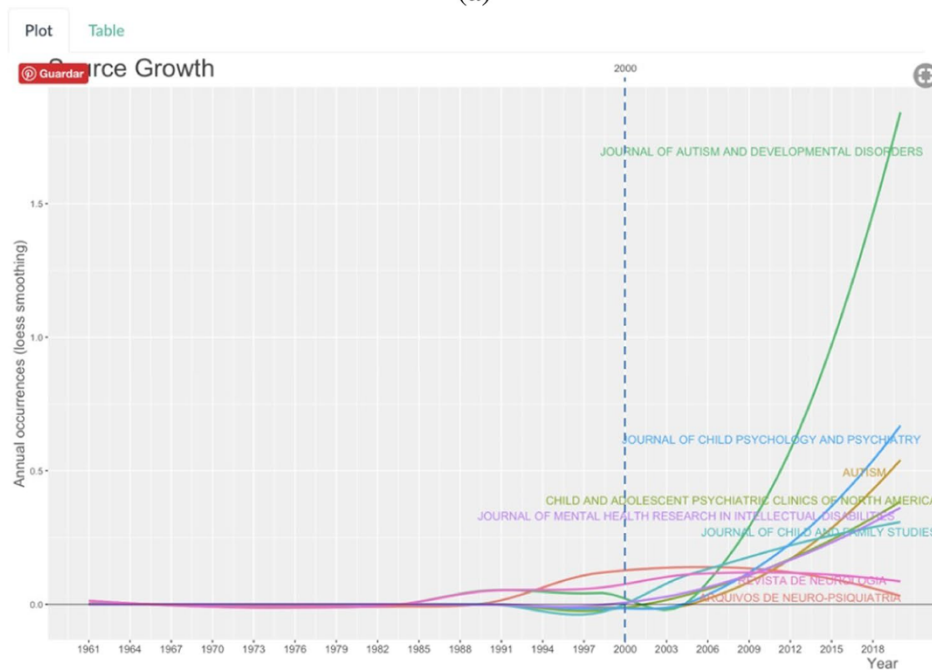
### 3.2. Results from the Conceptual Structure

Figure 14 shows the number of occurrences per year for both databases (Scopus (left), WoS (right)) during the period 1974-2020. A clear growth trend can be observed in both graphics. The source dynamics are a few different. It appears, nonetheless, that about 2000 there is a point of inflexion in both graphics. In the last 15 years, it should be noted that “Journal of Autism and Developmental disorders” is the journal with the most occurrences per year in both databases followed by “Child and Adolescent Psychiatric clinics of north America” in Scopus and “Journal of child Psychology and Psychiatry” in WoS.

There are two events that demonstrate this inflexion point. The first one is the false statement of vinculation between vaccines and autism (Wakefield A., 1998), and the second one is the addition of more behaviors added to be considered as autism spectrum disorder. We must bear in mind that the nomenclature has been evolving, first children's schizophrenia was used, and then other terms such as autistic and Asperger's began to be used to end up today using autistic spectrum.



(a)



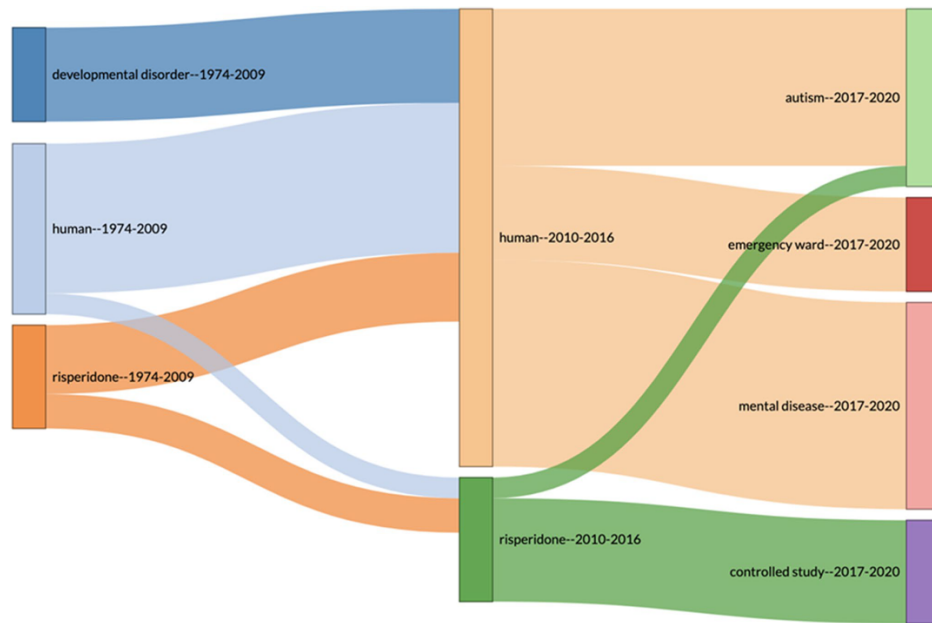
(b)

**Fig. 14.** Annual Occurrences during the period 1974-2020: (a) Scopus; (b) Web of Science (own elaboration)

Figure 15 shows the thematic evolution based on the Scopus database in the period between 1974 and 2020, divided in two periods, (1974-2009) and (2010-2020). The first period is more focused on the topics “human”, “Risperidone” and “developmental disorder”. The second period includes concepts that in some cases evolve to another topic, i.e. “autism” (2017-2020), “human” (2010-2016), “emergency ward” (2017-220), “mental disease” (2017-2020), “Risperidone” (2010-2016) and “controlled studies” (2017-2020).

If we analyze the first period, the topic of “human” (1974-2009) evolves to the topics “Risperidone” (2010-2016), “Autism” (2017-2020) and “human” (2010-2016) in the second period. The topic “Risperidone” (1974-2009) in the first period evolves to “Mental disease” (2017-2020) and “Risperidone” (2010-2016) in the second one.

Within the second period some topics also evolve. For example, “Human” (2010-2016) evolves to “Emergency ward” (2017-2020), and “Risperidone” (2010-2016) evolves to “controlled study” (2017-2020).



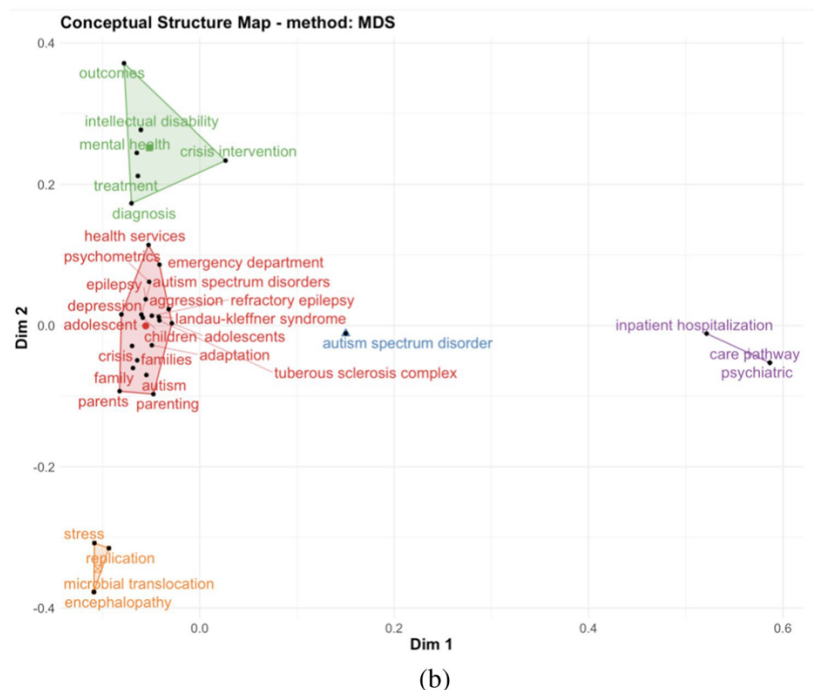
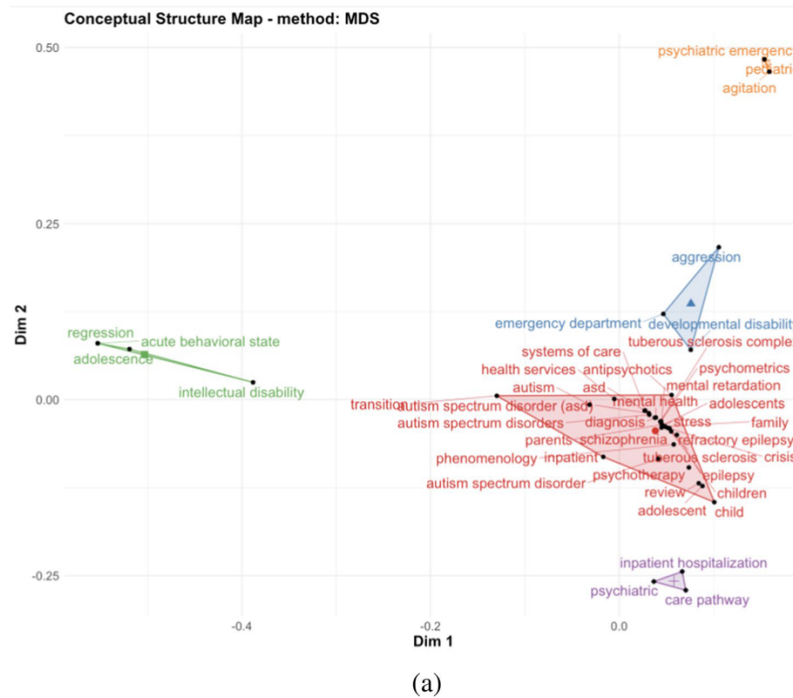
**Fig. 15** Thematic Evolution during the period 1974-2020 in Scopus database (own elaboration)

Figure 16 shows the factorial analysis of Scopus and WoS databases respectively. For this purpose, a multidimensional scaling method is used with 70 documents and the authors keywords as fields. Parameters such as the number of terms and the number of clusters are fixed to 20 and 5 respectively. Each color represents a cluster. Each cluster gives an idea of what terms usually go together in the publications and therefore how the article is approached. It should be noted that very different results are obtained between the two databases using the same keywords and doing the same analysis. So, we can affirm that each database gives different information on the same topic.

In the Scopus database, the first cluster (orange cluster) consists of words like “psychiatric emergency”, “pediatric” and “agitation”. The second one (blue cluster) is formed by “aggression”, “emergency department” and “development disability”. The third cluster (green cluster) consists of words like “regression”, “acute behavioral state”, “adolescence” and “intellectual disability”. The fourth cluster (purple cluster) is formed by words like “inpatient hospitalization”, “psychiatric”, and “care pathway”. The last cluster (red cluster) is the biggest one formed by words like “ASD”, “health care”, “refractory epilepsy”, “systems of care”, “mental retardation”, etc.

In the WoS database, the first cluster (orange cluster) consists of words like “stress”, “microbial translocation”, “encephalopathy” and “replication”. The second one (blue cluster) has an isolated item, “autism spectrum disorder”. The third cluster (green cluster) consists of words like “outcomes”, “intellectual disability”, “mental health”, “crisis-intervention”, “treatment” and “diagnosis”. The fourth cluster (purple cluster) is formed by words like “inpatient hospitalization”, and “care pathway psychiatric”. The last cluster (red cluster) is also the biggest one formed by words like “health services”, “emergency department”, “epilepsy”, “autism spectrum disorders”, “psychometrics”, etc.

Comparing all the information, we can see that both databases have a psychiatry cluster. Focusing mainly on the green cluster, in WoS it appears an interesting keyword in our hypothesis named “crisis intervention”, that would not appear if we search only in the Scopus database. We can highlight that in this cluster, both databases have a common term: “intellectual disability”. In the WoS database, we can find terms like “diagnosis” and “treatment” that are not in Scopus. Neither of the two databases show terms on prediction models. This statement allows us to reaffirm the gap presented on our hypothesis.



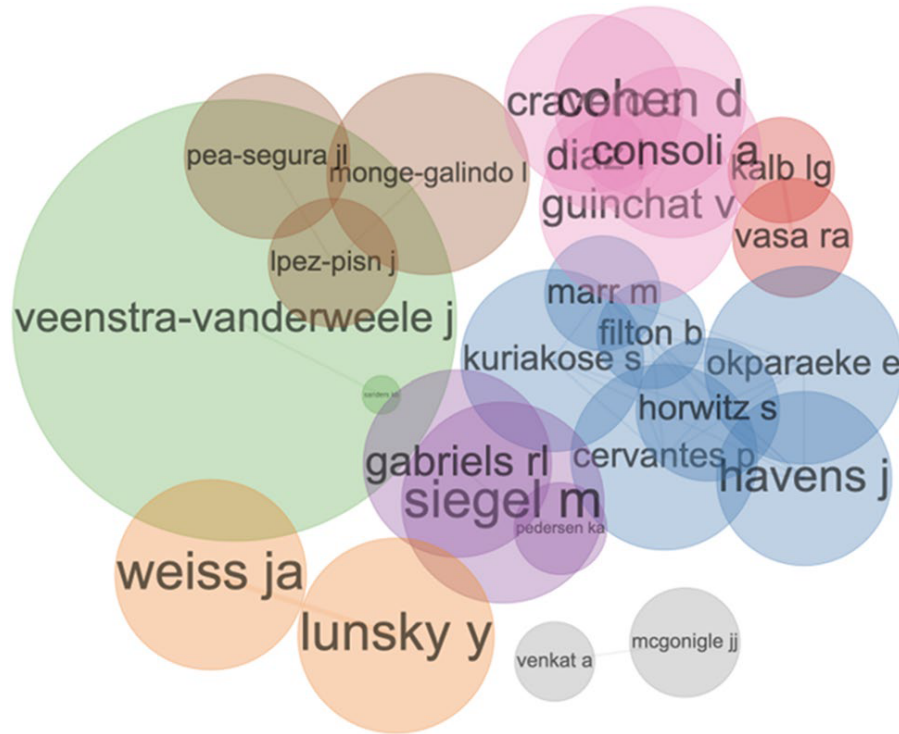
**Fig. 16** Conceptual Structure Map - method: MDS in: (a) Scopus; (b) Web of Science databases (own elaboration)

### 3.3. Results from the Social Structure

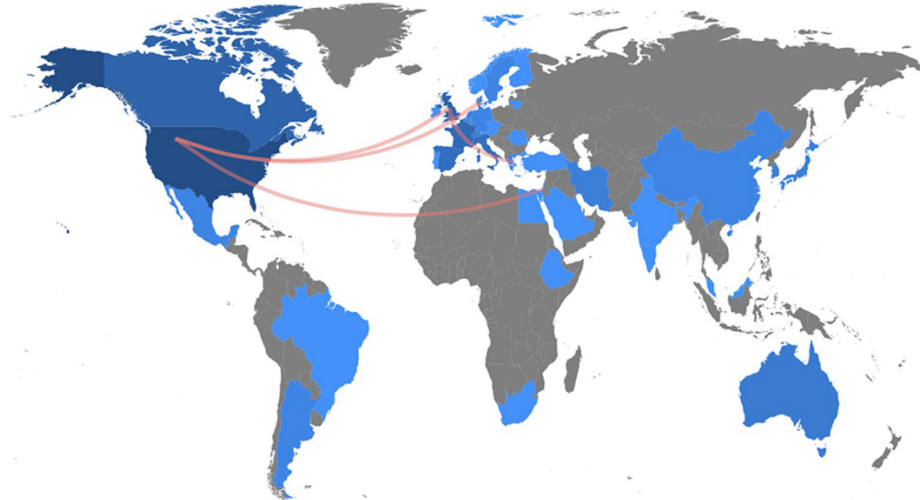
Figure 17 shows the collaboration map between authors. It can be seen that the authors who use a wide collaboration network are not the most referenced authors, a fact that shows that they tend to work more alone and not in community. It should be noted that the six authors with the most publications in Table 1 are found in this graph making couples, reaffirming the work groups explained in the table (Kalb-Vasa, Gabriels-Siegel, Weiss-Lunsky). Other groups of authors that don't appear in the table are Pea-Monge-Lopez, Venkat-Mcgonigle, Guinchat-Diaz, and others.

Figure 18 presents a geographic collaboration world map to tune the number of connections among the authors, providing a visual map of countries/authors who are working together, making academic communities and sharing knowledge with other researchers. Countries marked in blue indicate the countries where more research is carried out on the topic, otherwise the gray ones indicate countries where no research related to the topic is carried out.

USA is connected with United Kingdom, Denmark and Israel. Moreover, United Kingdom is connected to Greece. This graphic is useful to emphasize that autism research has a tendency to work in couples or in little groups and the network is not very extensive.

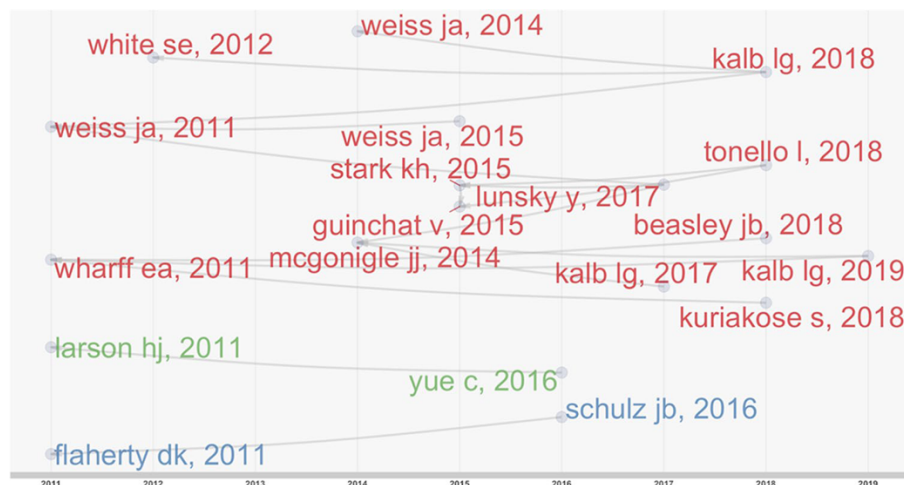


**Fig. 17** Collaborative network in WoS database (own elaboration)



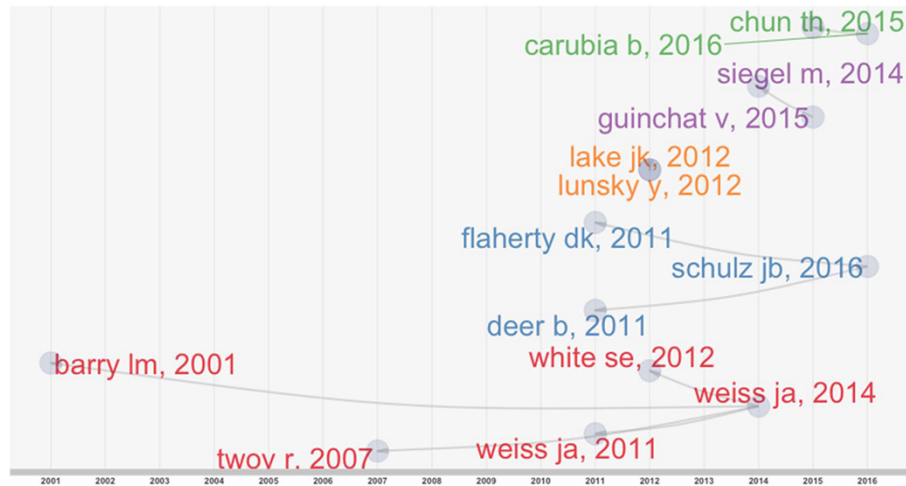
**Fig. 18** Collaboration world map in WoS database (own elaboration)

Figure 19 shows how the authors refer to each other in the period between 2011 and 2019 in WoS database. That figure shows that Weiss is the most predominant nexus between papers from 2001 and the authors that are publishing in the most recent years as Tonello or Kalb. Figure 19 and Figure 20 allow to see citations over time. Using both databases (Scopus and WoS), the data view of influences of the papers along time, it is clearer in the historiograph.



**Fig. 19** Historiograph in WoS database from 2011-2019 (own elaboration)





**Fig. 20** Direct citation network in Scopus database, period 2001-2016 (own elaboration)

#### 4. Conclusions and future work

The different analyzes of this study have allowed us to have a comparative vision from different points of view on the studies carried out in crisis in people with ASD. They have also allowed us to respond to the three hypotheses proposed in the introduction.

Our study has demonstrated that most articles in both databases are written in English (83% in Scopus and 84% in WoS). Other languages in WoS are Spanish, Portuguese, and Korean, meanwhile in Scopus these are French, Spanish and Danish. Both databases show an increase in the trend of publications from 2001 (Figure 3 and Figure 14), which corresponds to an increase of autism diagnosis that could be due to the addition of more behaviors on ASD term, and the false relationship between vaccines and autism, as stated in our first hypothesis.

As shown in the materials and methods section, the number of publications on behavioral crisis in autism is much lower (186 in Scopus and 157 in WoS, 343 in total) than the number of crisis studies in epilepsy (2749 in Scopus and 1954 in WoS, 4703 in total), with a very similar prevalence rate in both cases (0.638 % in the case of epilepsy, and 0.667% in the case of autism). This represents that 93.2% of all publications are about crisis in epilepsy, while only 6.8% are about crisis in autism. This information could be useful to affirm that there is a lack of studies on the topic of behavioral crisis in people with autism, in relation to studies carried out on a related topic, with similar prevalence as stated in the second hypothesis.

Our study demonstrates that by making a factorial analysis, we can affirm that each database gives different information on the same topic with the same keyword analysis. The bibliometric analysis analyzes aspects such as publication trend, thematic evolution, type of publication, language, publication trend by country, human development groups, communication networks, citations, and cluster of topics. These findings are of great importance given that the WoS database shows a cluster with the term of ‘crisis intervention’ but not about models and how to predict or prevent autism’s crisis. The analysis of the keywords shows that there is an interest in several subsectors, although a gap is detected in the area of crisis in people with autism. It should also be noted that there is no literature on what factors are influencing the possibility of a behavioral crisis. Only one study has been found (Tonello et al., 2018) that analyzes behavioral crises in autism, but not their possible causes. This confirms our third hypothesis.

Moreover, if a crisis could be predicted, its impact could be reduced or deleted and, surely, the daily life of people with autism and their families could be improved and would be able to improve professional medical treatment. The information obtained in this work has been useful to quantify the research on the autism topic and to affirm that there is less research than that which would correspond to such a prevalent disability. We are interested in research on filling this gap in order to gain knowledge in this area and developing solutions to improve their daily routines making a mathematical or computer model to predict crises.

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